

NMCP COVID-19 Literature Report #60: Friday, 19 February 2021

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Purpose: These weekly reports, published on Fridays, are curated collections of current research, evidence reviews, special reports, grey literature, and news regarding the COVID-19 pandemic that may be of interest to medical providers, leadership, and decision makers.

All reports are available online at <https://nmcp.libguides.com/covidreport>. Access is private; you will need to use the direct link or bookmark the URL, along with the case-sensitive password "NMCPfinest".

Disclaimer: I am not a medical professional. This document is current as of the date noted above. While I make every effort to find and summarize available data, I cannot cover everything in the literature on COVID-19. Please feel free to reach out with questions, suggestions for future topics, or any other feedback.

Statistics

Global today: 110,439,431 confirmed cases and 2,444,329 deaths in 192 countries/regions

12 FEB 2021: 107,897,155 confirmed cases and 2,370,870 deaths in 192 countries/regions

05 FEB 2021: 105,006,686 confirmed cases and 2,287,129 deaths in 192 countries/regions

United States*

top 5 states by cases

| | TOTAL US | CA | TX | FL | NY | IL |
|--------|------------|-----------|-----------|-----------|-----------|-----------|
| Cases | 27,898,118 | 3,512,088 | 2,578,510 | 1,849,744 | 1,568,624 | 1,168,683 |
| Deaths | 493,176 | 48,259 | 41,630 | 29,474 | 46,436 | 22,297 |

*see census.gov for current US Population data; NA: not all data available

[JHU CSSE](https://covid19.jhu.edu) as of 1000 EDT 19 February 2021

Virginia is ranked 17th in cases and 22nd in deaths.

| <i>Virginia</i> | Total (state) | Chesapeake | Hampton | Newport News | Norfolk | Portsmouth | Suffolk | Virginia Beach |
|------------------|---------------|------------|---------|--------------|---------|------------|---------|----------------|
| Cases | 559,930 | 17,619 | 8,322 | 10,995 | 14,394 | 7,435 | 6,671 | 29,552 |
| Hospitalizations | 23,369 | 815 | 280 | 295 | 771 | 565 | 360 | 1,212 |
| Deaths | 7,098 | 147 | 88 | 115 | 158 | 125 | 129 | 247 |

[VA DOH](https://vax.covid19.virginia.gov) as of 1000 EDT 19 February 2021

Upcoming Webinar

Topic: Data Driven Public Health Response to Pandemics: Maximizing Disease Surveillance, Genomic Sequencing, and Epidemic Forecasting

When: 24 February 2021 1100-1200 ET

Description: Join us on Wednesday, February 24 at 11am (ET) for the Capitol Hill Steering Committee on Pandemic Preparedness and Health Security webinar: Data Driven Public Health Response to Pandemics: Maximizing Disease Surveillance, Genomic Sequencing, and Epidemic Forecasting.

The COVID-19 pandemic has emphasized the need for enhanced disease surveillance capabilities both domestically and abroad. Epidemiological data has been the backbone for the global response to COVID-19. The country's COVID-19 experience has highlighted gaps in our domestic system and the need to increase our current capacity. The recent emergence of SARS-CoV-2 variants of concern with potential for increased transmission have sparked discussion on the need for genomic surveillance, adding to the conversation on what we can be doing as a country now to improve our COVID-19 response.

This webinar will address the current status of domestic disease surveillance and open a dialogue on how we can become better prepared for future public health threats.

Register: https://jh.zoom.us/webinar/register/WN_MWwz9rglSO2S7SIItSEihkQ

Special Reports

JHCHS: [Staying Ahead of the Variants: Policy Recommendations to Identify and Manage Current and Future Variants of Concern](#) (posted 16 February 2021)

"As of February 2021, 3 severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants of concern with worrisome characteristics have emerged, each on a different continent. The B.1.1.7 variant, first identified in the United Kingdom, is substantially more transmissible than previously circulating variants. The B.1.351 and P.1 variants, first identified in South Africa and Brazil, respectively, both exhibit some degree of immune escape. Each of these variants has precipitated resurgences in the communities where they have become dominant. All 3 have already been identified at low levels in the United States. If they gain a foothold, the same resurgences can be expected here.

Funding for increased genomic surveillance is expected in the next Congressional supplemental, among several investments in SARS-CoV-2 research. Key efforts to expand capacity and improve surveillance systems should be funded with this money. New guidance and policies are also needed to maximize the response. Notably, investments made now to build genomic surveillance infrastructure for coronavirus disease 2019 (COVID-19) will not only help us respond to the pandemic now but will also improve response for outbreaks of other pathogens in the future.

This document explains the current status of SARS-CoV-2 surveillance, sequencing, and variant characterization and provides recommendations for increasing the United States' capacity to respond to new variants."

The Advisory Committee on Immunization Practices (ACIP) has updated and published immunization schedules for pediatric and adults:

MMWR: [Advisory Committee on Immunization Practices Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger — United States, 2021](#)

MMWR: [Advisory Committee on Immunization Practices Recommended Immunization Schedule for Adults Aged 19 Years or Older — United States, 2021](#)

Selected Literature: Peer-Reviewed Journals

Date given is the date published or posted online; often these papers are ahead of print.

19 February 2021

MMWR: [First Month of COVID-19 Vaccine Safety Monitoring — United States, December 14, 2020–January 13, 2021](#)

"What is already known about this topic? Two COVID-19 vaccines have received Emergency Use Authorization for administration in the United States. In preauthorization clinical trials, local and systemic reactions were reported; no serious safety problems were detected.

What is added by this report? Monitoring, conducted as part of the U.S. vaccination program, indicates reassuring safety profiles for COVID-19 vaccines. Local and systemic reactions were common; rare reports of anaphylaxis were received. No unusual or unexpected reporting patterns were detected.

What are the implications for public health practice? Health care providers and vaccine recipients can be reassured about the safety of Pfizer BioNTech and Moderna COVID-19 vaccines. Counseling vaccine recipients to expect transient local and systemic reactions might ease concerns and encourage completion of the 2-dose vaccination series."

MMWR: [Maximizing Fit for Cloth and Medical Procedure Masks to Improve Performance and Reduce SARS-CoV-2 Transmission and Exposure, 2021](#)

"What is already known about this topic? Universal masking is recommended to slow the spread of COVID-19. Cloth masks and medical procedure masks substantially reduce exposure from infected wearers (source control) and reduce exposure of uninfected wearers (wearer exposure).

What is added by this report? CDC conducted experiments to assess two ways of improving the fit of medical procedure masks: fitting a cloth mask over a medical procedure mask, and knotting the ear loops of a medical procedure mask and then tucking in and flattening the extra material close to the face. Each modification substantially improved source control and reduced wearer exposure.

What are the implications for public health? These experiments highlight the importance of good fit to maximize mask performance. There are multiple simple ways to achieve better fit of masks to more effectively slow the spread of COVID-19."

18 February 2021

Clin Infect Dis: [Clinical and Laboratory Findings in Patients with Potential SARS-CoV-2 Reinfection, May–July 2020](#)

"We investigated patients with potential SARS-CoV-2 reinfection in the United States during May–July 2020.

We conducted case finding for patients with potential SARS-CoV-2 reinfection through the Emerging Infections Network. Cases reported were screened for laboratory and clinical findings of potential reinfection followed by requests for medical records and laboratory specimens. Available medical records were abstracted to characterize patient demographics, comorbidities, clinical course, and laboratory test results. Submitted specimens underwent further testing, including RT-PCR, viral culture, whole genome sequencing, subgenomic RNA PCR, and testing for anti-SARS-CoV-2 total antibody.

Among 73 potential reinfection patients with available records, 30 patients had recurrent COVID-19 symptoms explained by alternative diagnoses with concurrent SARS-CoV-2 positive RT-PCR, 24 patients remained asymptomatic after recovery but had recurrent or persistent RT-PCR, and 19 patients had recurrent COVID-19 symptoms with concurrent

SARS-CoV-2 positive RT-PCR but no alternative diagnoses. These 19 patients had symptom recurrence a median of 57 days after initial symptom onset (interquartile range: 47 – 76). Six of these patients had paired specimens available for further testing, but none had laboratory findings confirming reinfections. Testing of an additional three patients with recurrent symptoms and alternative diagnoses also did not confirm reinfection.

We did not confirm SARS-CoV-2 reinfection within 90 days of the initial infection based on the clinical and laboratory characteristics of cases in this investigation. Our findings support current CDC guidance around quarantine and testing for patients who have recovered from COVID-19."

Emerg Infect Dis: [Analysis of Asymptomatic and Presymptomatic Transmission in SARS-CoV-2 Outbreak, Germany, 2020](#)

"We determined secondary attack rates (SAR) among close contacts of 59 asymptomatic and symptomatic coronavirus disease case-patients by presymptomatic and symptomatic exposure. We observed no transmission from asymptomatic case-patients and highest SAR through presymptomatic exposure. Rapid quarantine of close contacts with or without symptoms is needed to prevent presymptomatic transmission."

JAMA Psychiatry: [Posttraumatic Stress Disorder in Patients After Severe COVID-19 Infection](#)

"This cross-sectional study found a PTSD prevalence of 30.2% after acute COVID-19 infection, which is in line with findings in survivors of previous coronavirus illnesses compared with findings reported after other types of collective traumatic events (Figure). Associated characteristics were female sex, which has been extensively described as a risk factor for PTSD, history of psychiatric disorders, and delirium or agitation during acute illness. In the PTSD group, we also found more persistent medical symptoms, often reported by patients after recovery from severe COVID-19."

Occup Med: [COVID-19 shelter-at-home and work, lifestyle and well-being in desk workers](#)

"Emerging cross-sectional reports find that the COVID-19 pandemic and related social restrictions negatively affect lifestyle behaviours and mental health in general populations.

To study the longitudinal impact of COVID-19 on work practices, lifestyle and well-being among desk workers during shelter-at-home restrictions.

We added follow-up after completion of a clinical trial among desk workers to longitudinally measure sedentary behaviour, physical activity, sleep, diet, mood, quality of life and work-related health using validated questionnaires and surveys. We compared outcomes assessed before and during COVID-19 shelter-at-home restrictions. We assessed whether changes in outcomes differed by remote working status (always, changed to or never remote) using analysis of covariance (ANCOVA).

Participants (N = 112; 69% female; mean (SD) age = 45.4 (12.3) years; follow-up = 13.5 (6.8) months) had substantial changes to work practices, including 72% changing to remote work. Deleterious changes from before to during shelter-at-home included: 1.3 (3.5)-h increase in non-workday sedentary behaviour; 0.7 (2.8)-point worsening of sleep quality; 8.5 (21.2)-point increase in mood disturbance; reductions in five of eight quality of life subscales; 0.5 (1.1)-point decrease in work-related health ($P < 0.05$). Other outcomes, including diet, physical activity and workday sedentary behaviour, remained stable ($P \geq 0.05$). Workers who were remote before and during the pandemic had greater increases in non-workday sedentary behaviour and stress, with greater declines in physical functioning. Wake time was delayed overall by 41 (61) min, and more so in workers who changed to remote.

Employers should consider supporting healthy lifestyle and well-being among desk workers during pandemic-related social restrictions, regardless of remote working status."

Skeletal Radiol: [Musculoskeletal involvement of COVID-19: review of imaging](#)

"The global pandemic of coronavirus disease 2019 (COVID-19) has revealed a surprising number of extra-pulmonary manifestations of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. While myalgia is a common clinical feature of COVID-19, other musculoskeletal manifestations of COVID-19 were infrequently described early during the pandemic. There have been emerging reports, however, of an array of neuromuscular and rheumatologic complications related to COVID-19 infection and disease course including myositis, neuropathy, arthropathy, and soft tissue abnormalities. Multimodality imaging supports diagnosis and evaluation of musculoskeletal disorders in COVID-19 patients. This article aims to provide a first comprehensive summary of musculoskeletal manifestations of COVID-19 with review of imaging."

17 February 2021

JAMA: [Effect of a Single High Dose of Vitamin D3 on Hospital Length of Stay in Patients With Moderate to Severe COVID-19: A Randomized Clinical Trial](#)

"Question: What is the effect of a single high dose of vitamin D3 on hospital length of stay among hospitalized patients with moderate to severe coronavirus disease 2019 (COVID-19)?

Findings: In this randomized clinical trial that involved 240 hospitalized patients with moderate to severe COVID-19, a single dose of 200 000 IU of vitamin D3, compared with placebo, did not significantly reduce hospital length of stay (median of 7.0 vs 7.0 days; unadjusted hazard ratio for hospital discharge, 1.07).

Meaning: The study does not support the use of a high dose of vitamin D3 for treatment of moderate to severe COVID-19 in hospitalized patients."

JAMA: [SARS-CoV-2 Variants of Concern in the United States—Challenges and Opportunities](#)

"This Viewpoint from directors at the CDC and NIH describes measures that federal agencies are taking to rapidly characterize emerging coronavirus variants and monitor their implications for national pandemic response and control, including assessment of ongoing effectiveness of current diagnostics, therapeutics, and vaccines."

MMWR: [First Identified Cases of SARS-CoV-2 Variant B.1.1.7 in Minnesota — December 2020–January 2021](#)

Variant Update: New virus variants that spread more easily could lead to a rapid rise in COVID-19 cases

A Minnesota investigation found:

- ⚠️ People infected with a new variant first detected in the United Kingdom had exposures from travel, the household, and the community
- ⚠️ Of the first 8 people identified with this variant, 6 reported recent travel (3 international, 3 domestic)

LESS TRAVEL → LESS SPREAD → FEWER CASES

- Wear a mask
- Stay at least 6 feet apart
- Avoid crowds
- Postpone travel
- Get vaccinated when available to you

CDC.GOV bit.ly/MMWR21721 MMWR

Nat Comm: [Innate cell profiles during the acute and convalescent phase of SARS-CoV-2 infection in children](#)

"Children have mild severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) confirmed disease (COVID-19) compared to adults and the immunological mechanisms underlying this difference remain unclear. Here, we report acute and convalescent innate immune responses in 48 children and 70 adults infected with, or exposed to, SARS-CoV-2. We find clinically mild SARS-CoV-2 infection in children is characterised by reduced circulating subsets of monocytes (classical, intermediate, non-classical), dendritic cells and natural killer cells during the acute phase. In contrast, SARS-CoV-2-infected adults show reduced proportions of non-classical monocytes only. We also observe increased proportions of CD63+ activated neutrophils during the acute phase to SARS-CoV-2 in infected children. Children and adults exposed to SARS-CoV-2 but negative on PCR testing

display increased proportions of low-density neutrophils that we observe up to 7 weeks post exposure. This study characterises the innate immune response during SARS-CoV-2 infection and household exposure in children."

NEJM: [Neutralizing Activity of BNT162b2-Elicited Serum — Preliminary Report](#)

"BNT162b2 is a nucleoside-modified RNA vaccine expressing the full-length prefusion spike glycoprotein (S) of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In a randomized, placebo-controlled clinical trial involving approximately 44,000 participants, immunization conferred 95% efficacy against coronavirus disease 2019 (Covid-19)."

16 February 2021

AJOG: [Higher SARS-CoV-2 Infection Rate in Pregnant Patients](#)

"During the early months of the coronavirus disease of 2019 (COVID-19) pandemic, risks to pregnant women of a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection were uncertain. Pregnant patients can serve as a model for the success of the clinical and public health response during public health emergencies as they are typically in frequent contact with the medical system. Population-based estimates of SARS-CoV-2 infections in pregnancy are unknown due to incomplete ascertainment of pregnancy status or inclusion of only single centers or hospitalized cases. Whether pregnant women were protected by the public health response or through their interactions with obstetrical providers in the early pandemic is poorly understood.

To estimate the SARS-CoV-2 infection rate in pregnancy and examine disparities by race/ethnicity and English-language proficiency in Washington State.

Pregnant patients with a polymerase chain reaction (PCR)-confirmed severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection diagnosed between March 1-June 30, 2020 were identified within 35 hospitals/clinic systems capturing 61% of annual deliveries in Washington State. Infection rates in pregnancy were estimated overall and by Washington State Accountable Community of Health (ACH) region and cross-sectionally compared to SARS-CoV-2 infection rates in similarly aged adults in Washington State. Race/ethnicity and language used for medical care among the pregnant patients were compared to recent data from Washington State.

A total of 240 pregnant patients with SARS-CoV-2 infections were identified during the study period with 70.7% from minority racial and ethnic groups. The principal findings in our study are: 1) The SARS-CoV-2 infection rate in pregnancy was 13.9/1,000 deliveries (95% confidence interval [CI], 8.3-23.2) compared to 7.3/1,000 (95%CI 7.2-7.4) in 20-39 year old adults in Washington State (Rate Ratio [RR] 1.7, 95%CI 1.3-2.3), 2) the SARS-CoV-2 infection

rate reduced to 11.3/1000 (95%CI 6.3-20.3) when excluding 45 cases of SARS-CoV-2 detected through asymptomatic screening (RR 1.3, 95%CI 0.96-1.9), 3) the proportion of SARS-CoV-2 cases in pregnancy among most non-white racial/ethnic groups was 2-4 fold higher than the race and ethnicity distribution of women in Washington State who delivered live births in 2018, and 5) the proportion of SARS-CoV-2 infected pregnant patients receiving medical care in a non-English language was higher than estimates of limited English proficiency in Washington State (30.4% versus 7.6%).

The SARS-CoV-2 infection rate in pregnant people was 70% higher than similarly aged adults in Washington State, which could not be completely explained by universal screening at delivery. Pregnant patients from nearly all racial/ethnic minority groups and patients receiving medical care in a non-English language were overrepresented. Pregnant women were not protected from COVID-19 in the early months of the pandemic with the greatest burden of infections occurring in nearly all racial/ethnic minority groups. This data coupled with a broader recognition that pregnancy is a risk factor for severe illness and maternal mortality strongly suggests that pregnant people should be broadly prioritized for COVID-19 vaccine allocation in the U.S. similar to some states."

Emerg Infect Dis: [Characteristics of SARS-CoV-2 Transmission among Meat Processing Workers in Nebraska, USA, and Effectiveness of Risk Mitigation Measures](#)

"The coronavirus disease (COVID-19) pandemic has severely impacted the meat processing industry in the United States. We sought to detail demographics and outcomes of severe acute respiratory syndrome coronavirus 2 infections among workers in Nebraska meat processing facilities and determine the effects of initiating universal mask policies and installing physical barriers at 13 meat processing facilities. During April 1–July 31, 2020, COVID-19 was diagnosed in 5,002 Nebraska meat processing workers (attack rate 19%). After initiating both universal masking and physical barrier interventions, 8/13 facilities showed a statistically significant reduction in COVID-19 incidence in <10 days. Characteristics and incidence of confirmed cases aligned with many nationwide trends becoming apparent during this pandemic: specifically, high attack rates among meat processing industry workers, disproportionately high risk of adverse outcomes among ethnic and racial minority groups and men, and effectiveness of using multiple prevention and control interventions to reduce disease transmission."

Radiology: [Ocular MRI Findings in Patients with Severe COVID-19: A Retrospective Multicenter Observational Study](#)

"COVID-19 may affect various organs. This paper reports 9 patients (1/9 [11%] woman and 8/9 [89%] men, mean age 56 ± 13 years) with globe MRI abnormalities obtained from a multicenter cohort of 129 patients presenting with severe COVID-19 from March 4th to May 1st, 2020. 9/129 (7%) patients had one or several FLAIR-WI hyperintense nodules of the

posterior pole of the globe. All patients had nodules in the macular region, 8/9 (89%) had bilateral nodules, 2/9 (22%) had nodules outside the macular region. Screening of these patients might improve the management of potentially severe ophthalmological manifestations of the virus."

15 February 2021

Int J Infect Dis: [Convalescent plasma treatment is associated with lower mortality and better outcomes in high risk COVID-19 patients – propensity score matched case-control study](#)

"The aim of the study was to investigate efficacy and safety of convalescent plasma (CP) transfusion in a group of high-risk COVID-19 patients.

This prospective study included 204 patients from a single tertiary-care hospital, hospitalized with COVID-19, of whom 102 were treated with CP administration and standard care (PG) and 102 others who received standard care only (CG). The CG was selected from 336 hospitalized patients using the propensity score matching (PSM) technique using age, MEWS score, and comorbidities. The primary outcome was mortality rate; secondary outcomes were the requirement of ventilator, length of ventilator need, length of intensive care unit (ICU) stay, and length of overall hospital confinement. Additionally, parameters predicting death in COVID-19 patients were identified.

Findings confirmed a significantly lower mortality rate in the PG versus the CG (13.7% vs. 34.3 %, $p = 0.001$) and a significant difference in cumulative incidence of death between the two groups ($p < 0.001$). CP treatment was associated to lower risk of death (OR = 0.25 CI95 [0.06; 0.91], $p = 0.041$). There were no significant differences in ICU stay, ventilator time, and hospitalization time between the two groups.

A significantly lower mortality rate was observed in the group of patients treated with CP. Age, presence of cardiac insufficiency, active cancer, requirement of ventilator, and length of hospitalization were significantly increasing the risk of death in both groups. Our study shows, that CP brings better outcomes when administrated in the earlier stage of high-risk COVID-19 disease."

J Infect Dis: [Viral load of SARS-CoV-2 in adults during the first and second wave of COVID-19 pandemic in Houston, TX: the potential of the super-spreader](#)

"During the COVID-19 pandemic, a minority of index cases are associated with a majority of secondary cases suggesting that super-spreaders could drive the pandemic. We identified a phenotype in individuals with extremely high viral load who could act as super-spreaders.

Data were analyzed from individuals tested for SARS-CoV-2 from March 18 through August 15, 2020. Outcomes were compared using contingency table and quantile regression to test the equality of medians between the pandemic waves and by viral load groups.

Of the 11,564 samples tested, 1,319 (11.4%) were positive for SARS-CoV-2. An increase in weekly median viral load occurred in the second wave of the SARS-CoV2 pandemic. This population was more likely to be women, outpatients, symptomatic and have an extremely high or high viral load. In patients with multiple RT-PCR positive tests, the duration of viral shedding was comparable between individuals with asymptomatic/mild and mild/moderate illness severity.

We detected a small group of individuals with extremely high SARS-CoV-2 viral load with mild illness. We believe that these individuals' characteristics could be consistent with the super-spreader phenomenon and that greater awareness of the social dynamics of these individuals is needed to understand the spread of SARS-CoV-2."

Lancet Respir Med: [Patient factors and temporal trends associated with COVID-19 in-hospital mortality in England: an observational study using administrative data](#)

"This was a retrospective exploratory analysis using the Hospital Episode Statistics administrative dataset. All patients aged 18 years or older in England who completed a hospital stay (were discharged alive or died) between March 1 and May 31, 2020, and had a diagnosis of COVID-19 on admission or during their stay were included. In-hospital death was the primary outcome of interest. Multilevel logistic regression was used to model the relationship between death and several covariates: age, sex, deprivation (Index of Multiple Deprivation), ethnicity, frailty (Hospital Frailty Risk Score), presence of comorbidities (Charlson Comorbidity Index items), and date of discharge (whether alive or deceased).

91 541 adult patients with COVID-19 were discharged during the study period, among which 28 200 (30.8%) in-hospital deaths occurred. The final multilevel logistic regression model accounted for age, deprivation score, and date of discharge as continuous variables, and sex, ethnicity, and Charlson Comorbidity Index items as categorical variables. In this model, significant predictors of in-hospital death included older age (modelled using restricted cubic splines), male sex (1.457 [1.408–1.509]), greater deprivation (1.002 [1.001–1.003]), Asian (1.211 [1.128–1.299]) or mixed ethnicity (1.317 [1.080–1.605]; vs White ethnicity), and most of the assessed comorbidities, including moderate or severe liver disease (5.433 [4.618–6.392]). Later date of discharge was associated with a lower odds of death (0.977 [0.976–0.978]); adjusted in-hospital mortality improved significantly in a broadly linear fashion, from 52.2% in the first week of March to 16.8% in the last week of May.

Reductions in the adjusted probability of in-hospital mortality for COVID-19 patients over time might reflect the impact of changes in hospital strategy and clinical processes. The reasons for the observed improvements in mortality should be thoroughly investigated to

inform the response to future outbreaks. The higher mortality rate reported for certain ethnic minority groups in community-based studies compared with our hospital-based analysis might partly reflect differential infection rates in those at greatest risk, propensity to become severely ill once infected, and health-seeking behaviours."

13 February 2021

Clin Infect Dis: [The Risk of Resurgence in Vaccine Preventable Infections Due to COVID-Related Gaps in Immunization](#)

"Nationally, immunization delivery has decreased significantly during COVID-19. Internationally, over 60 national vaccine programs have been disrupted or suspended. As a result of these immunization declines, the global community is at risk for a resurgence in vaccine preventable infections including measles, pertussis and polio; all highly contagious diseases that result in significant morbidity and mortality in children. Measles outbreaks have already occurred in many countries who suspended their vaccination programs. Outbreaks in the United States are likely to occur when social distancing stops and children return to school. Health care providers have acted quickly to institute multiple risk mitigation strategies to restore vaccine administration. However, childhood immunization rates remain below pre-COVID levels. Partnerships between healthcare providers, community leaders and local, state, regional and national public health departments are needed to reassure families that vaccine delivery during COVID is safe and to identify and catch-up those children who are under-immunized."

J Infect Dis: [S-variant SARS-CoV-2 lineage B1.1.7 is associated with significantly higher viral loads in samples tested by ThermoFisher TaqPath RT-qPCR](#)

"A SARS-CoV-2 variant B1.1.7 containing a mutation $\Delta 69/70$ has spread rapidly in the UK and shows an identifiable profile in ThermoFisher TaqPath RTqPCR (S-gene target failure; SGTF). We analysed recent test data for trends and significance. Linked Ct values for respiratory samples showed that a low Ct for ORF1ab and N were clearly associated with SGTF. Significantly more SGTF samples had higher inferred viral loads between 1×10^7 and 1×10^8 . Our conclusion is that patients whose samples exhibit the SGTF profile are more likely to have high viral loads, which may explain higher infectivity and rapidity of spread."

12 February 2021

JAMA: [Reports of Anaphylaxis After Receipt of mRNA COVID-19 Vaccines in the US—December 14, 2020-January 18, 2021](#)

"This JAMA Insights review provides clinical details of anaphylactic reactions reported to and verified by the CDC in the first month of use of the Pfizer-BioNTech and Moderna COVID-19 vaccines in the US, December 14, 2020-January 18, 2021."

JAMA Netw Open: [Effect of High-Dose Zinc and Ascorbic Acid Supplementation vs Usual Care on Symptom Length and Reduction Among Ambulatory Patients With SARS-CoV-2 Infection: The COVID A to Z Randomized Clinical Trial](#)

"Question: Do high-dose zinc, high-dose ascorbic acid, and/or a combination of the 2 reduce the duration of symptoms of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)?

Findings: In this randomized clinical trial of 214 patients with confirmed SARS-CoV-2 infection receiving outpatient care, there was no significant difference in the duration of symptoms among the 4 groups.

Meaning: These findings suggest that treatment with zinc, ascorbic acid, or both does not affect SARS-CoV-2 symptoms."

JAMA Netw Open: [Trends in US Pediatric Hospital Admissions in 2020 Compared With the Decade Before the COVID-19 Pandemic](#)

"Question: How have pediatric inpatient admission volumes changed in January to June 2020 compared with prior years?

Findings: This cross-sectional study of 5 424 688 admissions at 49 hospitals in the Pediatric Health Information Systems database used ensemble forecasting models to demonstrate differences between inpatient pediatric admissions in 2020 compared with prior years. There was a maximum 45.4% reduction in admissions in 2020, associated with a 27.7% reduction in hospital charges, with significant reductions in all examined diagnoses except for birth.

Meaning: In this study, inpatient pediatric admissions in 2020 were reduced across a heterogeneous range of diagnoses during the coronavirus disease 2019 pandemic."

JAMA Netw Open: [Age- and Sex-Associated Variations in the Sensitivity of Serological Tests Among Individuals Infected With SARS-CoV-2](#)

"This cohort study examines the sensitivity of antibody tests to detect previous severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection by time, test, sex, and age."

Lancet: [Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment](#)

"The COVID-19 pandemic is unlikely to end until there is global roll-out of vaccines that protect against severe disease and preferably drive herd immunity. Regulators in numerous

countries have authorised or approved COVID-19 vaccines for human use, with more expected to be licensed in 2021. Yet having licensed vaccines is not enough to achieve global control of COVID-19: they also need to be produced at scale, priced affordably, allocated globally so that they are available where needed, and widely deployed in local communities. In this Health Policy paper, we review potential challenges to success in each of these dimensions and discuss policy implications. To guide our review, we developed a dashboard to highlight key characteristics of 26 leading vaccine candidates, including efficacy levels, dosing regimens, storage requirements, prices, production capacities in 2021, and stocks reserved for low-income and middle-income countries. We use a traffic-light system to signal the potential contributions of each candidate to achieving global vaccine immunity, highlighting important trade-offs that policy makers need to consider when developing and implementing vaccination programmes. Although specific datapoints are subject to change as the pandemic response progresses, the dashboard will continue to provide a useful lens through which to analyse the key issues affecting the use of COVID-19 vaccines. We also present original data from a 32-country survey (n=26 758) on potential acceptance of COVID-19 vaccines, conducted from October to December, 2020. Vaccine acceptance was highest in Vietnam (98%), India (91%), China (91%), Denmark (87%), and South Korea (87%), and lowest in Serbia (38%), Croatia (41%), France (44%), Lebanon (44%), and Paraguay (51%)."

Pediatrics: [Factors Associated With Severe SARS-CoV-2 Infection](#)

"Initial reports on severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections in children suggested that very young age and comorbidities may increase risk of severe evolution, but these findings remained to be confirmed. We aimed to analyze the clinical spectrum of hospitalized pediatric SARS-CoV-2 infection and predictors of severe disease evolution.

We conducted a French national prospective surveillance of children hospitalized with SARS-CoV-2 infection. We included all children with confirmed SARS-CoV-2 infection in 60 hospitals during February 15 to June 1, 2020. The main outcome was the proportion of children with severe disease, defined by hemodynamic or ventilatory (invasive or not) support requirement.

We included 397 hospitalized children with SARS-CoV-2 infection. We identified several clinical patterns, ranging from paucisymptomatic children, admitted for surveillance, to lower respiratory tract infection or multisystem inflammatory syndrome in children. Children <90 days old accounted for 37% of cases (145 of 397), but only 4 (3%) had severe disease. Excluding children with multisystem inflammatory syndrome in children (n = 29) and hospitalized for a diagnosis not related to SARS-CoV-2 (n = 62), 23 of 306 (11%) children had severe disease, including 6 deaths. Factors independently associated with severity were

age ≥ 10 years (odds ratio [OR] = 3.4, 95% confidence interval: 1.1–10.3), hypoxemia (OR = 8.9 [2.6–29.7]), C-reactive protein level ≥ 80 mg/L (OR = 6.6 [1.4–27.5]).

In contrast with preliminary reports, young age was not an independent factor associated with severe SARS-CoV-2 infection, and children < 90 days old were at the lowest risk of severe disease evolution. This may help physicians to better identify risk of severe disease progression in children."

11 February 2021

Biophys J: [Hydrating the respiratory tract: an alternative explanation why masks lower severity of COVID-19](#)

"The seasonality of respiratory diseases has been linked, among other factors, to low outdoor absolute humidity and low indoor relative humidity, which increase evaporation of water in the mucosal lining of the respiratory tract. We demonstrate that normal breathing results in an absorption-desorption cycle inside facemasks, in which supersaturated air is absorbed by the mask fibers during expiration, followed by evaporation during inspiration of dry environmental air. For double-layered cotton masks, which have considerable heat capacity, the temperature of inspired air rises above room temperature, and the effective increase in relative humidity can exceed 100%. We propose that the recently reported, disease-attenuating effect of generic facemasks is dominated by the strong humidity increase of inspired air. This elevated humidity promotes mucociliary clearance of pathogens from the lungs, both before and after an infection of the upper respiratory tract has occurred. Effective mucociliary clearance can delay and reduce infection of the lower respiratory tract, thus mitigating disease severity. This mode of action suggests that masks can benefit the wearer even after an infection in the upper respiratory tract has occurred, complementing the traditional function of masks to limit person-to-person disease transmission. This potential therapeutical use should be studied further."

BMJ: [Early initiation of prophylactic anticoagulation for prevention of coronavirus disease 2019 mortality in patients admitted to hospital in the United States: cohort study](#)

"To evaluate whether early initiation of prophylactic anticoagulation compared with no anticoagulation was associated with decreased risk of death among patients admitted to hospital with coronavirus disease 2019 (covid-19) in the United States.

Nationwide cohort of patients receiving care in the Department of Veterans Affairs, a large integrated national healthcare system.

All 4297 patients admitted to hospital from 1 March to 31 July 2020 with laboratory confirmed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and without a history of anticoagulation.

The main outcome was 30 day mortality. Secondary outcomes were inpatient mortality, initiating therapeutic anticoagulation (a proxy for clinical deterioration, including thromboembolic events), and bleeding that required transfusion.

Of 4297 patients admitted to hospital with covid-19, 3627 (84.4%) received prophylactic anticoagulation within 24 hours of admission. More than 99% (n=3600) of treated patients received subcutaneous heparin or enoxaparin. 622 deaths occurred within 30 days of hospital admission, 513 among those who received prophylactic anticoagulation. Most deaths (510/622, 82%) occurred during hospital stay. Using inverse probability of treatment weighted analyses, the cumulative incidence of mortality at 30 days was 14.3% (95% confidence interval 13.1% to 15.5%) among those who received prophylactic anticoagulation and 18.7% (15.1% to 22.9%) among those who did not. Compared with patients who did not receive prophylactic anticoagulation, those who did had a 27% decreased risk for 30 day mortality (hazard ratio 0.73, 95% confidence interval 0.66 to 0.81). Similar associations were found for inpatient mortality and initiation of therapeutic anticoagulation. Receipt of prophylactic anticoagulation was not associated with increased risk of bleeding that required transfusion (hazard ratio 0.87, 0.71 to 1.05). Quantitative bias analysis showed that results were robust to unmeasured confounding (e-value lower 95% confidence interval 1.77 for 30 day mortality). Results persisted in several sensitivity analyses.

Early initiation of prophylactic anticoagulation compared with no anticoagulation among patients admitted to hospital with covid-19 was associated with a decreased risk of 30 day mortality and no increased risk of serious bleeding events. These findings provide strong real world evidence to support guidelines recommending the use of prophylactic anticoagulation as initial treatment for patients with covid-19 on hospital admission."

Postgrad Med J: [COVID-19 detection by dogs: from physiology to field application-a review article](#)

"For years, the dog, man's best friend, was the most widely employed scent-detector tool for civilian and military purposes. Recently, many studies highlighted the role of canine olfactory ability in the medical field, specifically in detecting different infectious, metabolic and neoplastic conditions. The objective of this literature review is to clarify the rationale behind dog's ability to detect diseases, to assess the possible application for COVID-19 detection and to discuss the evidence available on the matter. Available evidence shows that properly trained disease-detector dogs are an efficient tool for identification of specific disease-associated volatile organic compounds marker profiles for a particular disease. And

since COVID-19 positive persons have a specific volatilome different from non-infected persons, they can be recognised by the dogs, by sniffing different body fluids consequently aiding in the diagnosis of COVID-19. Possible applications of dogs as COVID-19 detectors will be an easy real-time mobile diagnostic aid with low cost and good performance. More evidence is needed to be able to describe standardised measures concerning the best fluid to test, testing procedure, time of possible detection according to disease evolution, risks associated with the dog exposure and to translate the good results in study setting into the real-life operational one."

PNAS: [The effects of school closures on SARS-CoV-2 among parents and teachers](#)

"To reduce the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), most countries closed schools, despite uncertainty if school closures are an effective containment measure. At the onset of the pandemic, Swedish upper-secondary schools moved to online instruction, while lower-secondary schools remained open. This allows for a comparison of parents and teachers differently exposed to open and closed schools, but otherwise facing similar conditions. Leveraging rich Swedish register data, we connect all students and teachers in Sweden to their families and study the impact of moving to online instruction on the incidence of SARS-CoV-2 and COVID-19. We find that, among parents, exposure to open rather than closed schools resulted in a small increase in PCR-confirmed infections (odds ratio [OR] 1.17; 95% CI [CI95] 1.03 to 1.32). Among lower-secondary teachers, the infection rate doubled relative to upper-secondary teachers (OR 2.01; CI95 1.52 to 2.67). This spilled over to the partners of lower-secondary teachers, who had a higher infection rate than their upper-secondary counterparts (OR 1.29; CI95 1.00 to 1.67). When analyzing COVID-19 diagnoses from healthcare visits and the incidence of severe health outcomes, results are similar for teachers, but weaker for parents and teachers' partners. The results for parents indicate that keeping lower-secondary schools open had minor consequences for the overall transmission of SARS-CoV-2 in society. The results for teachers suggest that measures to protect teachers could be considered."

10 February 2021

Euro Surveill: [Impact of age, ethnicity, sex and prior infection status on immunogenicity following a single dose of the BNT162b2 mRNA COVID-19 vaccine: real-world evidence from healthcare workers, Israel, December 2020 to January 2021](#)

"The coronavirus disease (COVID-19) pandemic, which started in 2019 in China, continues to spread, despite multiple lockdowns and prolonged control measures implemented in most countries. As at 25 January 2021, over 99 million cases and 2.1 million deaths were reported globally [1]. In December 2020, several vaccine candidates were shown to be safe and efficacious in trials [2-4] and mass vaccination (in combination with existing control

measures) is seen as one of the central elements to controlling the pandemic. Although clinical trial data are encouraging, real-world evidence with regards to the vaccines remains scarce. In particular, describing immunogenicity and effectiveness among specific ethnic groups is important as the disease disproportionately affects certain ethnic minorities for reasons not fully understood but not fully attributable to socio-demographic factors [5,6]. Likewise, the post-vaccination immune response among those previously infected remains unclear. Here we present early results from vaccination in healthcare workers (HCWs) in Israel."

NEJM: [An Outbreak of Covid-19 on an Aircraft Carrier](#)

"A retrospective observational study conducted by physicians at the Military Instruction Hospital during April 2020 found that, among 1739 crew members aboard a French aircraft carrier in April 2020, 64% tested positive for COVID-19 via real-time polymerase chain reaction (RT-PCR), with there being significant variations in symptomatic presentation (Figure 1) and antibody development. This article suggests viral circulation in local outbreaks requires further testing and analysis." (Summary from [COVID-19 LST](#))

PLoS One: [Aerosol emission of adolescents voices during speaking, singing and shouting](#)

"Since the outbreak of the COVID-19 pandemic, singing activities for children and young people have been strictly regulated with far-reaching consequences for music education in schools and ensemble and choir singing in some places. This is also due to the fact, that there has been no reliable data available on aerosol emissions from adolescents speaking, singing, and shouting. By utilizing a laser particle counter in cleanroom conditions we show, that adolescents emit fewer aerosol particles during singing than what has been known so far for adults. In our data, the emission rates ranged from 16 P/s to 267 P/s for speaking, 141 P/s to 1240 P/s for singing, and 683 P/s to 4332 P/s for shouting. The data advocate an adaptation of existing risk management strategies and rules of conduct for groups of singing adolescents, like gatherings in an educational context, e.g. singing lessons or choir rehearsals."

09 February 2021

Ann Intern Med: [Major Update: Remdesivir for Adults With COVID-19 : A Living Systematic Review and Meta-analysis for the American College of Physicians Practice Points](#)

"Purpose: To update a previous review of remdesivir for adults with COVID-19, including new meta-analyses of patients with COVID-19 of any severity compared with control.

Data Sources: Several sources from 1 January 2020 through 7 December 2020.

Study Selection: English-language, randomized controlled trials (RCTs) of remdesivir for COVID-19. New evidence is incorporated by using living review methods.

1 reviewer abstracted data; a second reviewer verified the data. The Cochrane Risk of Bias Tool and GRADE (Grading of Recommendations Assessment, Development and Evaluation) method were used.

The update includes 5 RCTs, incorporating data from a new large RCT and the final results of a previous RCT. Compared with control, a 10-day course of remdesivir probably results in little to no reduction in mortality (risk ratio [RR], 0.93 [95% CI, 0.82 to 1.06]; 4 RCTs) but may result in a small reduction in the proportion of patients receiving mechanical ventilation (RR, 0.71 [CI, 0.56 to 0.90]; 3 RCTs). Remdesivir probably results in a moderate increase in the percentage of patients who recovered and a moderate decrease in serious adverse events and may result in a large reduction in time to recovery. Effect on hospital length of stay or percentage remaining hospitalized is mixed. Compared with a 10-day course for those not requiring ventilation at baseline, a 5-day course may reduce mortality, the need for ventilation, and serious adverse events while increasing the percentage of patients who recovered or clinically improved.

In hospitalized adults with COVID-19, remdesivir probably results in little to no mortality difference but probably improves the percentage recovered and reduces serious harms and may result in a small reduction in the proportion receiving ventilation. For patients not receiving ventilation, a 5-day course may provide greater benefits and fewer harms with lower drug costs than a 10-day course."

Blood Adv: [American Society of Hematology 2021 guidelines on the use of anticoagulation for thromboprophylaxis in patients with COVID-19](#)

"Coronavirus disease 2019 (COVID-19)–related critical illness and acute illness are associated with a risk of venous thromboembolism (VTE).

These evidence-based guidelines of the American Society of Hematology (ASH) are intended to support patients, clinicians, and other health care professionals in decisions about the use of anticoagulation for thromboprophylaxis for patients with COVID-19–related critical illness and acute illness who do not have confirmed or suspected VTE.

ASH formed a multidisciplinary guideline panel and applied strict management strategies to minimize potential bias from conflicts of interest. The panel included 3 patient representatives. The McMaster University GRADE Centre supported the guideline-development process, including performing systematic evidence reviews (up to 19 August 2020). The panel prioritized clinical questions and outcomes according to their importance for clinicians and patients. The panel used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach, including GRADE Evidence-to-Decision

frameworks, to assess evidence and make recommendations, which were subject to public comment.

The panel agreed on 2 recommendations. The panel issued conditional recommendations in favor of prophylactic-intensity anticoagulation over intermediate-intensity or therapeutic-intensity anticoagulation for patients with COVID-19–related critical illness or acute illness who do not have confirmed or suspected VTE.

These recommendations were based on very low certainty in the evidence, underscoring the need for high-quality, randomized controlled trials comparing different intensities of anticoagulation. They will be updated using a living recommendation approach as new evidence becomes available."

Infect Control Hosp Epidemiol: [Occupational Risk Factors for SARS-CoV-2 Infection among Healthcare Personnel: A Cross-Sectional Analysis of Subjects Enrolled in the COPE Study](#)

"Among 353 healthcare personnel in a longitudinal cohort in four hospitals in Atlanta, GA (May-June 2020), 23 (6.5%) had SARS-CoV-2 antibodies. Spending >50% of a typical shift at bedside (OR 3.4, 95% CI: 1.2–10.5) and Black race (OR 8.4, 95% CI: 2.7–27.4) were associated with SARS-CoV-2 seropositivity."

Otolaryngol Head Neck Surg: [COVID-19 Preprocedural Testing: What About the False Positives?](#)

NMCP authors: "In the COVID-19 era, preprocedural patients are almost uniformly screened for symptoms, asked to quarantine preoperatively, and then undergo a test of uncertain validity with very low pretest probability. A small percentage of these tests return positive. As a result, surgical procedures are delayed and patients are required to quarantine. Are these asymptomatic patients truly positive for COVID-19? What are the impacts of these test results on the patient and the health care system? In the following commentary, we review how the uncertain validity of reverse transcription polymerase chain reaction testing combined with a low-prevalence population predisposes for false-positive results. As a mitigation strategy, we ask that readers refocus on the fundamental principal of diagnostic testing: pretest probability."

08 February 2021

J Matern Fetal Neonatal Med: [SARS-CoV-2 detection in human milk: a systematic review](#)

"To synthesize the current evidence for the presence of SARS-CoV-2 RNA in the human milk of mothers with confirmed COVID-19 and its potential role in neonatal SARS-CoV-2 infection.

Using terms related to novel coronavirus 2019 and human milk, a systematic search was performed in three electronic databases (PubMed, EMBASE, and Web of Science) for studies published between December 2019 and 15 October 2020. Published peer-reviewed studies reporting the results of RT-PCR for SARS-CoV-2 RNA in human milk in mothers with confirmed COVID-19 were included. Proportion meta-analysis of case series and prospective cohort studies was performed using STATA version 14.2 (StataCorp, College Station, TX) and pooled estimate (with 95% confidence interval) of overall incidence of SARS-CoV-2 transmission was calculated.

We identified 936 records, of which 34 studies (24 case-reports, 10 cohort studies) were eligible for this systematic review. A total of 116 confirmed COVID-19 lactating women (88 in cohort and 28 in case-reports) underwent RT-PCR testing in human milk, and 10 (six in case reports) were detected to have SARS-CoV-2 RNA. The overall pooled proportion (from cohort studies) for SARS-CoV-2 RNA detection in human milk was 2.16% (95% CI: 0.0-8.81%, I²: 0%). Four studies (six patients) also reported the presence of SARS-CoV-2 specific antibodies (along with RT-PCR) in human milk.

The limited low-quality evidence suggests that SARS-CoV-2 RNA is detected in human milk in an extremely low proportion, however, based on current evidence no conclusion can be drawn about its infectivity and impact on the infants. In concordance with World Health Organization recommendations, exclusive breastfeeding should be considered in all cases unless any other contraindication exists."

ICYMI (older than the last 2 weeks)

Stroke: [Acute Ischemic Stroke and COVID-19](#) (04 February 2021)

"We analyzed the data from 54 health care facilities using the Cerner deidentified COVID-19 dataset. The dataset included patients with an emergency department or inpatient encounter with discharge diagnoses codes that could be associated to suspicion of or exposure to COVID-19 or confirmed COVID-19.

A total of 103 (1.3%) patients developed acute ischemic stroke among 8163 patients with COVID-19. Among all patients with COVID-19, the proportion of patients with hypertension, diabetes, hyperlipidemia, atrial fibrillation, and congestive heart failure was significantly higher among those with acute ischemic stroke. Acute ischemic stroke was associated with discharge to destination other than home or death (relative risk, 2.1 [95% CI, 1.6–2.4]; $P < 0.0001$) after adjusting for potential confounders. A total of 199 (1.0%) patients developed acute ischemic stroke among 19 513 patients without COVID-19. Among all ischemic stroke patients, COVID-19 was associated with discharge to destination other than

home or death (relative risk, 1.2 [95% CI, 1.0–1.3]; P=0.03) after adjusting for potential confounders.

Acute ischemic stroke was infrequent in patients with COVID-19 and usually occurs in the presence of other cardiovascular risk factors. The risk of discharge to destination other than home or death increased 2-fold with occurrence of acute ischemic stroke in patients with COVID-19."

Neuro Sci: [Facemask headache: a new nosographic entity among healthcare providers in COVID-19 era](#) (27 January 2021)

"SARS-CoV-2 is a novel infectious agent causing coronavirus disease 2019, which has been declared as pandemic in March 2020. Personal protective equipment has been mandatory for healthcare workers in order to contain the outbreak of pandemic disease. Mild neurological disturbances such as headache have been related to the extensive utilization of facemask. This study aims to examine headache variations related to the intensive utilization of facemask among a cohort of healthcare professionals in a setting of low-medium risk of exposure to SARS-CoV-2.

This is a cross-sectional study among healthcare providers from different hospital and clinics in Italy. Each participant completed a specifically designed self-administered questionnaire. Headache features and outcome measures' change from baseline were evaluated over a 4-month period, in which wearing facemask has become mandatory for Italian healthcare workers.

A total of 400 healthcare providers completed the questionnaire, 383 of them met the inclusion criteria. The majority were doctors, with a mean age of 33.4 ± 9.2 years old. Among 166/383 subjects, who were headache free at baseline, 44 (26.5%) developed de novo headache. Furthermore, 217/383 reported a previous diagnosis of primary headache disorder: 137 were affected by migraine and 80 had tension-type headache. A proportion (31.3%) of these primary headache sufferers experienced worsening of their pre-existing headache disorder, mainly for migraine frequency and attack mean duration.

Our data showed the appearance of de novo associated facemask headache in previous headache-free subjects and an exacerbation of pre-existing primary headache disorders, mostly experienced by people with migraine disease."

Nature: [Global absence and targeting of protective immune states in severe COVID-19](#) (published 25 January 2021)

"Although infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has pleiotropic and systemic effects in some individuals^{1,2,3}, many others experience milder symptoms. Here, to gain a more comprehensive understanding of the distinction between severe and mild phenotypes in the pathology of coronavirus disease 2019 (COVID-19) and

its origins, we performed a whole-blood-preserving single-cell analysis protocol to integrate contributions from all major immune cell types of the blood—including neutrophils, monocytes, platelets, lymphocytes and the contents of the serum. Patients with mild COVID-19 exhibit a coordinated pattern of expression of interferon-stimulated genes (ISGs)³ across every cell population, whereas these ISG-expressing cells are systemically absent in patients with severe disease. Paradoxically, individuals with severe COVID-19 produce very high titres of anti-SARS-CoV-2 antibodies and have a lower viral load compared to individuals with mild disease. Examination of the serum from patients with severe COVID-19 shows that these patients uniquely produce antibodies that functionally block the production of the ISG-expressing cells associated with mild disease, by activating conserved signalling circuits that dampen cellular responses to interferons. Overzealous antibody responses pit the immune system against itself in many patients with COVID-19, and perhaps also in individuals with other viral infections. Our findings reveal potential targets for immunotherapies in patients with severe COVID-19 to re-engage viral defence."

Pediatr Pulmonol: [COVID-19 and multisystem inflammatory syndrome in children: A systematic review and meta-analysis](#) (published 11 January 2021)

"Multisystem inflammatory syndrome in children (MIS-C) associated with coronavirus disease 2019 has been increasingly recognized. However, the clinical features of MIS-C and the differences from Kawasaki disease remain unknown. The study aims to investigate the epidemiology and clinical course of MIS-C.

PubMed and EMBASE were searched through August 30, 2020. Observational studies describing MIS-C were included. Data regarding demographic features, clinical symptoms, laboratory, echocardiography and radiology findings, treatments, and outcomes were extracted. Study-specific estimates were combined using one-group meta-analysis in a random-effects model.

A total of 27 studies were identified including 917 MIS-C patients. The mean age was 9.3 (95% confidence interval [CI], 8.4–10.1). The pooled proportions of Hispanic and Black cases were 34.6% (95% CI, 28.3–40.9) and 31.5% (95% CI, 24.8–38.1), respectively. The common manifestations were gastrointestinal symptoms (87.3%; 95% CI, 82.9–91.6) and cardiovascular involvement such as myocardial dysfunction (55.3%; 95% CI, 42.4–68.2), coronary artery aneurysms (21.7%; 95% CI, 12.8–30.1) and shock (65.8%; 95% CI, 51.1–80.4), with marked elevated inflammatory and cardiac markers. The majority of patients received intravenous immunoglobulin (81.0%; 95% CI, 75.0–86.9), aspirin (67.3%; 95% CI, 48.8–85.7), and corticosteroids (63.6%; 95% CI, 53.4–73.8) with a variety of anti-inflammatory agents. Although myocardial dysfunction improved in 55.1% (95% CI, 33.4–76.8) at discharge, the rate of extracorporeal membrane oxygenation use was 6.3% (95% CI, 2.8–9.8) and the mortality was 1.9% (95% CI, 1.0–2.8).

Our findings suggest that MIS-C leads to multiple organ failure, including gastrointestinal manifestations, myocardial dysfunction and coronary abnormalities, and has distinct features from Kawasaki disease."

Nature: [SARS-CoV-2 evolution during treatment of chronic infection](#) (05 February 2021)

"SARS-CoV-2 Spike protein is critical for virus infection via engagement of ACE2, and is a major antibody target. Here we report chronic SARS-CoV-2 with reduced sensitivity to neutralising antibodies in an immune suppressed individual treated with convalescent plasma, generating whole genome ultradeep sequences over 23 time points spanning 101 days. Little change was observed in the overall viral population structure following two courses of remdesivir over the first 57 days. However, following convalescent plasma therapy we observed large, dynamic virus population shifts, with the emergence of a dominant viral strain bearing D796H in S2 and Δ H69/ Δ V70 in the S1 N-terminal domain NTD of the Spike protein. As passively transferred serum antibodies diminished, viruses with the escape genotype diminished in frequency, before returning during a final, unsuccessful course of convalescent plasma. In vitro, the Spike escape double mutant bearing Δ H69/ Δ V70 and D796H conferred modestly decreased sensitivity to convalescent plasma, whilst maintaining infectivity similar to wild type. D796H appeared to be the main contributor to decreased susceptibility but incurred an infectivity defect. The Δ H69/ Δ V70 single mutant had two-fold higher infectivity compared to wild type, possibly compensating for the reduced infectivity of D796H. These data reveal strong selection on SARS-CoV-2 during convalescent plasma therapy associated with emergence of viral variants with evidence of reduced susceptibility to neutralising antibodies."

Selected Literature: Preprints

Preprints are found on preprint servers such as [arXiv](#), [bioRxiv](#), and [medRxiv](#); they are commonly used for biomedical research. Preprints may later be published in peer-reviewed journals. Per medRxiv: "Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

medRxiv: [FDA-authorized COVID-19 vaccines are effective per real-world evidence synthesized across a multi-state health system](#) (posted 18 February 2021)

"Large Phase 3 clinical trials of the two FDA-authorized COVID-19 vaccines, mRNA-1273 (Moderna) and BNT162b2 (Pfizer/BioNTech), have demonstrated efficacies of 94.1% (n = 30,420, 95% CI: 89.3-96.8) and 95% (n = 43,448, 95% CI: 90.3-97.6) in preventing symptomatic COVID-19, respectively. Given the ongoing vaccine rollout to healthcare

personnel and residents of long-term care facilities, here we provide a preliminary assessment of real-world vaccination efficacy in 62,138 individuals from the Mayo Clinic and associated health system (Arizona, Florida, Minnesota, Wisconsin) between December 1st 2020 and February 8th 2021.

Our retrospective analysis contrasts 31,069 individuals receiving at least one dose of either vaccine with 31,069 unvaccinated individuals who are propensity-matched based on demographics, location (zip code), and number of prior SARS-CoV-2 PCR tests. 8,041 individuals received two doses of a COVID-19 vaccine and were at risk for infection at least 36 days after their first dose. Administration of two COVID-19 vaccine doses was 88.7% effective in preventing SARS-CoV-2 infection (95% CI: 68.4-97.1%) with onset at least 36 days after the first dose. Furthermore, vaccinated patients who were subsequently diagnosed with COVID-19 had significantly lower 14-day hospital admission rates than propensity-matched unvaccinated COVID-19 patients (3.7% vs. 9.2%; Relative Risk: 0.4; p-value: 0.007).

Building upon the previous randomized trials of these vaccines, this study demonstrates their real-world effectiveness in reducing the rates of SARS-CoV-2 infection and COVID-19 severity among individuals at highest risk for infection."

medRxiv: [Reinfection Rates among Patients who Previously Tested Positive for COVID-19: a Retrospective Cohort Study](#) (posted 16 February 2021)

"Objectives: To evaluate reinfection rates and protective effectiveness of prior disease among patients with coronavirus disease 2019 (COVID-19) infection in the United States. Design Retrospective cohort study Setting: One multi-hospital health system in Ohio and Florida Participants: All 150,325 patients who were tested for COVID-19 infection via PCR from March 12, 2020 to August 30, 2020. Testing performed up to January 7, 2021 in these patients was included for analysis. Healthcare workers were excluded. Main outcome measures The main outcome was reinfection, defined as infection \geq 90 days after initial testing. Secondary outcomes were symptomatic infection and protective effectiveness of prior infection.

Results: Of 150,325 patients tested for COVID-19 prior to August 30, 8,845 (5.9%) tested positive and 141,480 (94.1%) tested negative. 974 (11%) of the positive patients were retested after 90 days, and 56 had possible reinfection. Of those, 26 (46.4 %) were symptomatic. Of those with initial negative testing, 4,163 (12.9%) were subsequently positive and 2,460 of those (59.1%) were symptomatic. Protective effectiveness of prior infection was 78.5% (95% confidence interval 72.0 to 83.5), and against symptomatic infection was 83.1% (95% confidence interval 75.1 to 88.5). Protective effectiveness increased over time.

Conclusions: Prior infection in patients with COVID-19 was highly protective against reinfection and symptomatic disease. Protective effectiveness increased over time, suggesting that viral shedding or ongoing immune response may persist beyond 90 days and may not represent true reinfection. As vaccine supply is a limited resource around the world, patients with known history of COVID-19 could delay early vaccination to allow for the most vulnerable to access the vaccine and slow transmission."

medRxiv: [Emergence in late 2020 of multiple lineages of SARS-CoV-2 Spike protein variants affecting amino acid position 677](#) (posted 14 February 2021)

"The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike protein (S) plays critical roles in host cell entry. Non-synonymous substitutions affecting S are not uncommon and have become fixed in a number of SARS-CoV-2 lineages. A subset of such mutations enable escape from neutralizing antibodies or are thought to enhance transmission through mechanisms such as increased affinity for the cell entry receptor, ACE2. Independent genomic surveillance programs based in New Mexico and Louisiana contemporaneously detected the rapid rise of numerous clade 20G (lineage B.1.2) infections carrying a Q677P substitution in S. The variant was first detected in the US on October 23, yet between 01 Dec 2020 and 19 Jan 2021 it rose to represent 27.8% and 11.3% of all SARS-CoV-2 genomes sequenced from Louisiana and New Mexico, respectively. Q677P cases have been detected predominantly in the south central and southwest United States; as of 03 Feb 2021, GISAID data show 499 viral sequences of this variant from the USA. Phylogenetic analyses revealed the independent evolution and spread of at least six distinct Q677H sub-lineages, with first collection dates ranging from mid August to late November, 2020. Four 677H clades from clade 20G (B.1.2), 20A (B.1.234), and 20B (B.1.1.220, and B.1.1.222) each contain roughly 100 or fewer sequenced cases, while a distinct pair of clade 20G clusters are represented by 754 and 298 cases, respectively. Although sampling bias and founder effects may have contributed to the rise of S:677 polymorphic variants, the proximity of this position to the polybasic cleavage site at the S1/S2 boundary are consistent with its potential functional relevance during cell entry, suggesting parallel evolution of a trait that may confer an advantage in spread or transmission. Taken together, our findings demonstrate simultaneous convergent evolution, thus providing an impetus to further evaluate S:677 polymorphisms for effects on proteolytic processing, cell tropism, and transmissibility."

News in Brief

"The coronavirus is here to stay — here's what that means: A *Nature* survey shows many scientists expect the virus that causes COVID-19 to become endemic, but it could pose less danger over time" ([Nature](#)).

COVID-19 cases are dropping, thanks to 'social distancing, seasonality, seroprevalence, and shots' ([Atlantic](#)).

The New Variants

According to 2 new preliminary reports, the Pfizer/BioNTech and Moderna vaccines are less effective against the South Africa variant in lab-based experiments ([NEJM letter to the editor 1](#) and [NEJM letter to the editor 2](#)).

"Pfizer plans to test COVID-19 vaccine booster targeting the South African variant" ([Reuters](#)).

"How 'killer' T cells could boost COVID immunity in face of new variants: In the race against emerging coronavirus variants, researchers are looking beyond antibodies for clues to lasting protection from COVID-19" ([Nature](#)).

Immunocompromised patients may be providing a 'breeding ground' for mutations and SARS-CoV-2 variants ([Philadelphia Inquirer](#)).

Transmission, Testing, and Mitigation Measures

A study in the UK has gained approval to conduct a coronavirus 'challenge trial' where healthy volunteers are intentionally infected with the virus ([WashPo](#)).

Of all the ways you might be exposed to SARS-CoV-2, getting the virus from your food is not likely one of them ([FDA](#)).

Over 10 million counterfeit N95 masks were seized by the government during an ongoing investigation ([AP](#)).

"Denmark's Supreme Court on Thursday sentenced a man to four months' imprisonment for coughing at two police officers while shouting "corona" during a routine traffic stop in March last year" ([Reuters](#)).

Vaccines

"COVID vaccines and safety: what the research says" ([Nature](#)).

Oxford will test its COVID-19 vaccine co-developed with AstraZeneca in 300 children aged 6-17 ([WashPo](#)).

The first FEMA mass vaccination sites for COVID-19 have opened in California ([CNN](#)).

"Four people in Oregon have tested positive for the coronavirus after receiving both doses of the COVID-19 vaccine, health officials said" ([NBC](#)).

According to South Korean intelligence officials, North Korea tried to steal coronavirus vaccine information by hacking into Pfizer servers ([WashPo](#)).

"The myth of 'good' and 'bad' Covid vaccines: Why false perceptions overlook facts, and could breed resentment" ([STAT](#)).

Vaccines – Who's Getting Them?

A 90-year old Seattle woman walked 6 miles through nearly a foot of snow to get her coronavirus vaccine; it was unclear if it was uphill both ways ([Seattle Times](#)).

"One-third of US troops are refusing the COVID vaccine. History may help explain why" ([Defense One](#)).

A big chunk of the world isn't getting the COVID vaccines – 130 countries have not even started vaccinating people ([NPR](#)).

How We Should Talk About Vaccines

"Health care workers are organizing online networks to promote Covid shots, strategically aiming to drown out vaccine opponents active on those sites" ([Politico](#)).

"Delay a shot? Skip one? Vaccine-dosing messaging is a nightmare. Vaccine regimens need both science and public trust to succeed" ([Atlantic](#)).

Long Reads

"Here's how COVID vaccines are made — and why we can't just start making a lot more of them" ([BuzzFeed](#)).

"Voices from the pandemic: 'Tomorrow. Tomorrow I'll start to feel better.' – Kaitlin Denis, on approaching Year Two of living with COVID-19" ([WashPo](#)).

Other Outbreaks and Infectious Diseases

Guinea is facing a new Ebola outbreak 5 years after being declared Ebola-free ([NPR](#); see also: [tweet from Africa CDC](#)).

The CDC is investigating a *Listeria monocytogenes* outbreak in four states (including Virginia) that has sickened and hospitalized 7 people; "Hispanic-style fresh and soft cheeses (like queso fresco)" have been implicated ([CDC](#)).

There are reported cases of extensively drug-resistant *Salmonella* Typhi infections in Americans without a history of international travel ([CDC](#)).

And Now for Something Completely Different: Space Edition

NASA's Perseverance rover has landed on Mars and already started sending back its first images of the planet ([CNN](#); [Twitter](#); [watch the landing from NASA](#)).

Krispy Kreme offered a special doughnut for the occasion – I heard it was out of this world ([Facebook](#)).



References

Statistics

JHU CSSE: Johns Hopkins Center for Systems Science and Engineering. Coronavirus COVID-19 Global Cases. Link: <https://coronavirus.jhu.edu/map.html>

VA DOH: Virginia Department of Health. COVID-19 in Virginia. Link: <http://www.vdh.virginia.gov/coronavirus/>

Special Reports

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